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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/065,057	09/13/2002	Joseph Shouliau Zhu	RD28753-1	2590
23413	7590	04/06/2004	EXAMINER	
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			NICOLAS, WESLEY A	
			ART UNIT	PAPER NUMBER
			1742	

DATE MAILED: 04/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	<p>Application No.</p> <p>10/065,057</p>	<p>Applicant(s)</p> <p>ZHU ET AL.</p>	
	<p>Examiner</p> <p>Wesley A. Nicolas</p>	<p>Art Unit</p> <p>1742</p>	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 15-30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/14/02</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is in response to the response to the restriction requirement submitted March 2, 2004. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-30 are currently pending in this application, with claims 15-30 drawn to a non-elected invention.

Election/Restriction

1. This application contains claims 15-30 drawn to an invention nonelected with traverse in Paper mailed February 18, 2004. A complete reply to the this rejection must include cancelation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01. Accordingly, the restriction is hereby being made **FINAL**.

In the response submitted March 2, 2004, Applicant asserts that "despite the Examiner's contention that the inventions claimed are distinct, the search and examination of the entire application can be made without serious burden, ecause of the closely related nature of the two inventions." (response submitted March 4, 2004, page 1). In response, Examiner must respectfully disagree. The inventions are not closely related and would impose a serious burden on the Examiner to search both inventions. Furthermore, since Applicant has not provided express admission that the claimed inventions are indistinct as required by Lee, the restriction as set forth in the previous Office action has been maintained. In re Lee, 199 USPQ 108 (Deputy Asst. Comm'r. for Pats 1978).

Drawings

2. The replacement drawings submitted by Applicant were received on January 22, 2003. These drawings are APPROVED.

Claim Objections

3. Claim 11 is objected to because of the following informalities: "current" in line 1 should be changed to "voltage" because the claim specifies voltage, not current.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-6, 8-10, 11, and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Wei et al. (U.S. 6,352,636 B1).

Claims 1-6, and 8-10 are rejected because Wei et al. teach of an electropolishing solution and method which comprises at least 75 wt. % of an alkylene glycol (Table II) and between 5 and 20 wt. % of a chloride salt such as sodium chloride or potassium chloride (Table I).

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Regarding the alkylene glycol, Wei et al. disclose vol. % of alkylene glycol between 25 vol. % and 75 vol. %. While Applicant claims concentration in wt. %, the respective conversions of 75 vol. % alkylene glycol with the balance water are as follows:

- Diethylene glycol (density = 1.184 g/cm³ which corresponds to 78 wt. %)
- Glycerol (density = 1.2653 g/cm³ which corresponds to 79 wt. %)
- Propylene glycol (density = 1.0381 which corresponds to 75.7 wt. %)
- Ethylene glycol (density = 1.115 which corresponds to 77 wt. %)

Claim 11 is rejected because Wei et al. teach that the voltage is applied which can vary from a trace voltage, to about 30 V (col. 6, lines 45-49).

Claim 13 is rejected because Wei et al. teach that the temperature of the electrolyte may vary up to 150° C (col. 6, lines 50-52).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

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3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wei et al. (6,352,636) as applied to claim 1 above.

Wei et al. are as applied, argued, and disclosed above and incorporated herein, but fail to specifically teach less than 0.5 wt. % fluoride ion. Wei et al. does however teach 4.5 wt. % fluoride (Table I where fluoride is 45% by weight of NaF and NaF is at minimum 10 wt. %).

Claim 7 is rejected because it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified the Wei et al. invention to use a low fluoride concentration because Wei et al. teach that fluoride is used as a charge carrying component (Table I and col. 5, lines 8-12) and one of ordinary skill in the art would have routinely adjusted the amount of charger carrying component to regulate the current efficiency of the electrolyte.

9. Claims 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wei et al. (6,352,636) as applied to claim 10 above, and further in view of Blomsterberg (4,269,677).

Wei et al. are as applied, argued, and disclosed above and incorporated herein, but fail to specifically teach an operating current density or metal removal rate.

Regarding claim 12, Blomsterberg teaches of a preferred current density of about 3 to about 25 A/dm² (col. 2 lines 14-24 - which corresponds to about 0.03 to 0.25

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A/cm²). It would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified the Wei et al. invention to include the current density of Blomsterberg because Blomsterberg teaches a current density of about 0.03 to 0.25 A/cm² (col. 2 lines 14-24) which would have allowed for efficient electropolishing of the substrate surface.

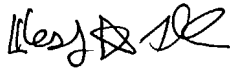
Regarding claim 14, neither Wei et al. nor Blomsterberg teach of specific metal removal rate. However, the it would have been obvious and within the ordinary skill in the art at the time the invention was made to have modified the metal removal rate depending on the specific substrate treated and the desired operating efficiency, because said factors are directly dependent on metal removal rate.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wesley Nicolas whose telephone number is (571) 272-1247. The examiner can normally be reached on Mon.-Thurs. from 7 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached at (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov> . Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Wesley A. Nicolas
Primary Examiner

March 31, 2004